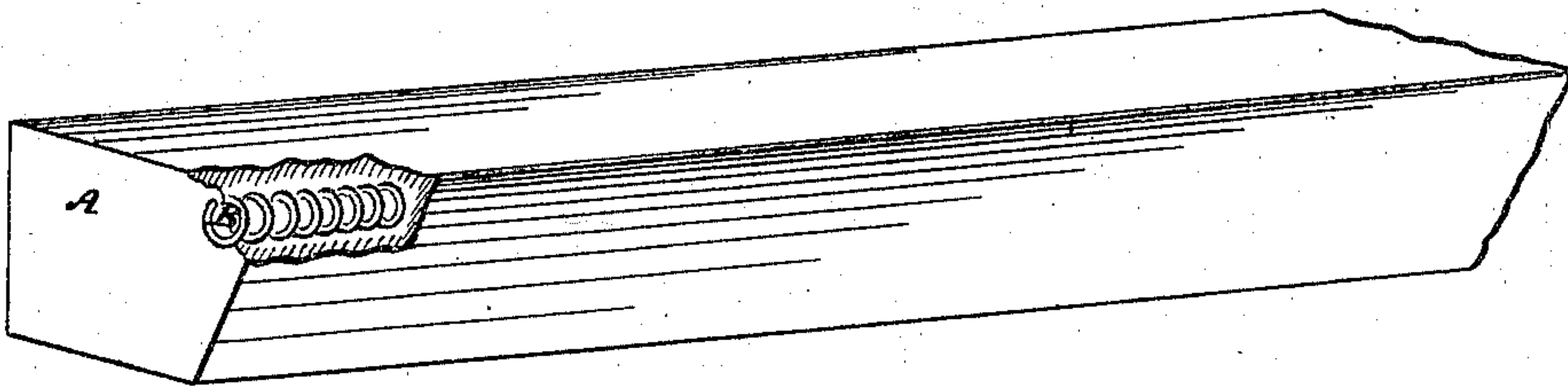


H. A. ALDEN.
Billiard Cushions.

No. 138,356.

Patented April 29, 1873.



Witnesses

John D. [unclear]
Wm. J. Anderson

Inventor.

Henry A. Alden.
by atty. A. [unclear]

UNITED STATES PATENT OFFICE.

HENRY A. ALDEN, OF MATTEAWAN, NEW YORK.

IMPROVEMENT IN BILLIARD-CUSHIONS.

Specification forming part of Letters Patent No. **138,356**, dated April 29, 1873; application filed March 15, 1873.

To all whom it may concern:

Be it known that I, HENRY A. ALDEN, of Matteawan, Dutchess county, in the State of New York, have invented certain new and useful Improvements in Billiard-Cushions, of which the following is a specification:

My invention relates to billiard-cushions composed in the main of vulcanized rubber. This material is of great value in the formation of billiard-cushions, and is now universally used for the purpose. Where cushions are formed entirely of rubber, it has, however, been found that the ball is liable to unduly embed itself in the rubber, and to be deflected inaccurately, and also is apt to hop or jump when rebounding from the cushion. Attempts have been made with more or less success to remedy these defects, by incorporating in the cushion, or combining therewith, some substance or device of a harder and more resistant nature than the soft rubber, which substance or device, located at the point where the ball strikes the cushion, will prevent, to a greater or less extent, the embedding of the ball, as well as its hopping or jumping. For this purpose, the cushion has been faced with cork, hard rubber, metal, &c.; or a cord of metal or material has been applied to the face near the upper and inner corner of the cushion; or a cord, or thin narrow strip of hard rubber, metal, or horn, has been placed within the body and near the upper and inner corner of the unvulcanized cushion, the two being afterward united by vulcanization. These are a few of the many ways in which it has been attempted to obviate the difficulties above alluded to.

The object of my invention is to overcome these difficulties. In proceeding to do so, I follow some of the methods previously in use to this extent, to wit: The device for preventing embedding and jumping is incorporated in the rubber body of the cushion; but as to the device itself, my invention widely differs from any heretofore employed. I make use of a spirally-coiled spring which extends from end to end of the India-rubber cushion, being located therein at or near the upper and inner corner of the same. The spirally-coiled wire which I employ is a spring, or has a spring action, both longitudinally and transversely. It is ca-

pable of a spring-like action longitudinally, or in the direction of its length, so that while it will give back or yield under the impact of the ball, it tends, by its inherent elasticity, to resume its normal position independently of the assistance afforded it in this respect by the rubber. It has a spring-like action transversely, for each circular fold of the wire is a spring which, when struck on its periphery by the ball will, after yielding, recoil, to assist in throwing off the ball, thus adding to the resiliency of the cushion. The core of rubber, which may be within the metallic spiral, will increase and add to these effects, while both core and spiral are backed by the highly elastic body of rubber which composes the main portion of the cushion, and which, through the medium of the spiral against which the ball strikes, exerts its own power, superadded to the inherent elasticity of the spiral and its core, to repel the ball. At the same time, the embedding of the ball in the cushion is prevented to a great extent, owing to the resistance offered by the metallic body, and thus the angle of reflection is rendered as nearly as possible accurate—*i. e.*, equal to the angle of incidence.

I thus produce a cushion more sensitive and more highly elastic than heretofore, while at the same time the undue embedding of the ball, as well as its hopping, are to a great extent, if not entirely, prevented. Another advantage possessed by the cushion is, that there is no necessity for the employment of the straining devices which are needed for metallic cords or flat metal springs in order to keep them under proper tension. The spiral does not require the use of such devices, and is always under the same tension, owing to the engagement of its folds with the rubber body, whereby its proper tension is maintained at all times without requiring accessory mechanical devices for the purpose.

The accompanying drawing represents a portion of a cushion made in accordance with my invention.

The rubber body A of the cushion is of any ordinary or suitable shape. Embedded in the cushion at or near the upper corner of the same, is a tubular spring of spirally-coiled wire, B, extending the length of the cushion. The spiral coil is put into the rubber body before

the latter is vulcanized, and while it is in the green or plastic state. The rubber cushion is then vulcanized in the usual manner, by which operation the spiral and rubber are united and held firmly together. The spiral may be filled with a green-rubber core before being placed in the body of the cushion; or it may be put in the body of rubber of which the cushion is to be made, without having any previous filling or core, the green rubber being forced within the bore and between the folds of the spiral, by compression in a suitable form or mold. Various ways of inserting the spiral, however, may be employed, as will be readily understood by manufacturers of vulcanized India-rubber cushions, and other articles. It is not absolutely essential to the efficacy of the spiral that it should have a core or filling of rubber, and, if desired, the latter can be dispensed with.

Cushions thus made are to be fitted to cush-

ion-rails, and covered in the way ordinarily practiced in manufacturing and putting up billiard-tables.

Having now described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

The combination, with a vulcanized India-rubber billiard-cushion, of a spirally-coiled metallic spring embedded in said cushion at or near the upper and inner corner of the same, substantially as and for the purposes herein set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

HENRY A. ALDEN.

Witnesses:

A. POLLOK,
JNO. P. RIDER.